

Raphaël Schroeter, PhD in Physics

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EMPLOYER	Harvard University Physics Department 17 Oxford Street, Cambridge, MA 02138, USA	April 2011 - Present
	CSIC Consejo Superior de Investigaciones Científicas Instituto de Física Corpuscular (IFIC) Edificio de Institutos de Investigación, PO Box 22085, E-46071 Valencia	December 2009 - March 2011
	Université de Genève Département de Physique Nucléaire et Corpusculaire 24, Quai Ernest Ansermet, 1211 Genève 4, Switzerland	November 2004 - November 2009
EDUCATION	Université de Genève , Genève, Switzerland PhD in particle physics Dissertation: <i>“Extraction of kaon production cross-sections in HARP”</i> <ul style="list-style-type: none">• Graduation date: March 10, 2011• Advisors: Dr Alain Blondel (Genève), Dr Anselmo Cervera (Valencia) Diplôme en Physique Dissertation: <i>“Prediction of neutrino flux at the K2K far detector from HARP data”</i>	November 2004 - March 2011 September 2004
ACADEMIC POSITIONS	Research Associate Harvard University Advisor: Gary Feldman Graduate Research Assistant Consejo Superior de Investigaciones Científicas Supervisor: Alain Blondel, Anselmo Cervera Villanueva Graduate Research Assistant Université de Genève Supervisor: Alain Blondel, Anselmo Cervera Villanueva	April 2011 - Present December 2009 - March 2011 November 2004 - November 2009
HONOURS AND AWARDS	Prix du Meilleur Diplôme de la Société Valaisanne de Physique, 2004	

CURRENT
RESEARCH
INTERESTS

NO ν A

The NO ν A experiment is the next generation long-baseline, accelerator-based neutrino oscillation experiment, currently under construction at Fermilab and northern Minnesota. NO ν A will improve the existing constraints on electron neutrino appearance by more than an order of magnitude by comparing electron neutrino rates observed by two totally active liquid scintillator detectors, located 14 mrad off the NuMI neutrino beam axis. Running a NuMI facility upgraded to 700 kW of beam power in neutrino and anti-neutrino modes, on an 810 km long baseline, NO ν A can establish the neutrino mass hierarchy and will pioneer searches for CP violation in the leptonic sector.

RESEARCH
EXPERIENCE

NO ν A

March 2012 - Present

Co-convener of the NO ν A beam systematics and simulation group

HARP

March 2005 - March 2011

Analysis work on Kaon production cross-sections

Extraction of the charged kaons double differential cross section from 12.9GeV incident protons on an aluminum target.

HARP

November 2004 - March 2005

Alignment of the PID detectors

Development of a method using residuals to align the forward PID detectors (time of flight wall, electromagnetic calorimeter and threshold cherenkov) with respect to the drift chambers (main tracking devices).

T2K

March 2005 - April 2006

R&D on GEM TPC prototype

Working group coordinator for the development of a Gas Electron Multiplier (GEM) readout prototype as an option for the TPC of the near detector of the T2K neutrino experiment. Test of the prototype in the HARP TPC environment at CERN.

K2K

August 2003 - September 2004

Prediction of neutrino flux at the K2K far detector from HARP data

Development of a method to predict the neutrinos flux at the K2K far detector using the HARP data to reduce the systematic errors on the far to near ratio. 5 weeks travel to Japan taking shifts for the K2K experiment in both the near detector (KEK) and far detector (Kamioka).

PARTICIPATION IN
EXPERIMENTS

Experiment	Motivation	Research Center	City	Date
K2K	Neutrino Oscillation	KEK	Tsukuba (Japan)	2003-2005
HARP	Hadron production	CERN	Geneva (Switzerland)	2004-2011
T2K	Neutrino Oscillation	JPARC	Tokai (Japan)	2005-2011
NO ν A	Neutrino Oscillation	Fermilab	Batavia (USA)	2011-Present

TEACHING
EXPERIENCE

Université de Genève, Genève, Switzerland

November 2004 - June 2008

Laboratory Assistant

2nd and 3rd year undergraduate physics laboratory, included demonstrating the laboratory practicals and marking student's work.

CONFERENCE
PRESENTATIONS

NUFACT09

Working Group Presentation

Title: Status and Prospects for Hadron Production Experiments

Publication: AIP Conference Proceedings Vol. 1222 (2010) 181-185

Venue: IIT, Chicago, Illinois

Year: 2009

Neutrino 2012

Poster

Title: Neutrino Physics with the NO ν A Experiment

Venue: Kyoto TERRSA, Kyoto, Japan

Year: 2012

Fermilab User's Meeting

Poster

Title: Neutrino Beam at NO ν A

Venue: Fermilab, Batavia, Illinois

Year: 2013

SUMMER
SCHOOLS

NUFACT06 Summer School

Venue: UCLA and the University of California, Irvine, California

Year: 2006

International Neutrino School

Venue: Fermilab, Batavia, Illinois

Year: 2007

SELECTED
PUBLICATIONS

- [1] M. Apollonio *et al.*, **HARP** Collaboration, "Comparison of large-angle production of charged pions with incident protons on cylindrical long and short targets," [arXiv:0909.0337 \[hep-ex\]](#).
- [2] M. Apollonio *et al.*, **HARP** Collaboration, "Forward production of charged pions with incident protons on nuclear targets at the CERN PS," *Phys. Rev.* **C80** (2009) 035208, [arXiv:0907.3857 \[hep-ex\]](#).
- [3] M. Apollonio *et al.*, **HARP** Collaboration, "Forward production of charged pions with incident π^\pm on nuclear targets measured at the CERN PS," *Nucl. Phys.* **A821** (2009) 118–192, [arXiv:0902.2105 \[hep-ex\]](#).
- [4] M. G. Catanesi *et al.*, **HARP** Collaboration, "Forward π^\pm production in p-O2 and p-N2 interactions at 12 GeV/c," *Astropart. Phys.* **30** (2008) 124–132, [arXiv:0807.1025 \[hep-ex\]](#).
- [5] M. G. Catanesi *et al.*, **HARP** Collaboration, "Measurement of the production cross-sections of π^\pm in p - C and π^\pm - C interactions at 12-GeV/c," *Astropart. Phys.* **29** (2008) 257–281.
- [6] M. G. Catanesi *et al.*, "Absolute momentum calibration of the HARP TPC," *JINST* **3** (2008) P04007.
- [7] M. G. Catanesi *et al.*, **HARP** Collaboration, "Large-angle production of charged pions with 3-12.9 GeV/c incident protons on nuclear targets," *Phys. Rev.* **C77** (2008) 055207, [arXiv:0805.2871 \[hep-ex\]](#).
- [8] A. Rodriguez *et al.*, **K2K** Collaboration, "Measurement of single charged pion production in the charged-current interactions of neutrinos in a 1.3 GeV wide band beam," *Phys. Rev.* **D78** (2008) 032003, [arXiv:0805.0186 \[hep-ex\]](#).
- [9] N. Abgrall *et al.*, "Characterization of a high resolution triple Gas Electron Multiplier (GEM) detector," *Nucl. Phys. Proc. Suppl.* **172** (2007) 234–236.
- [10] S. Mine *et al.*, **K2K** Collaboration, "Experimental study of the atmospheric neutrino backgrounds for proton decay to positron and neutral pion searches in water Cherenkov detectors," *Phys. Rev.* **D77** (2008) 032003, [arXiv:0801.0182 \[hep-ex\]](#).
- [11] A. Artamonov *et al.*, "The Time Response of Glass Resistive Plate Chambers to Heavily Ionizing Particles," *JINST* **2** (2007) P10004, [arXiv:0709.3756 \[physics.ins-det\]](#).
- [12] M. G. Catanesi *et al.*, **HARP** Collaboration, "Large-angle production of charged pions by 3 GeV/c - 12 GeV/c protons on carbon, copper and tin targets," *Eur. Phys. J.* **C53** (2008)

- [13] M. G. Catanesi *et al.*, **HARP** Collaboration, “Large-angle production of charged pions by 3 GeV/c - 12.9 GeV/c protons on beryllium, aluminium and lead targets,” *Eur. Phys. J.* **C54** (2008) 37–60, [arXiv:0709.3458 \[hep-ex\]](#).
- [14] M. G. Catanesi *et al.*, **HARP** Collaboration, “Momentum scale in the HARP TPC,” [arXiv:0709.2806 \[physics.ins-det\]](#).
- [15] J. Bouchez *et al.*, “Bulk micromegas detectors for large TPC applications,” *Nucl. Instrum. Meth.* **A574** (2007) 425–432.
- [16] M. G. Catanesi *et al.*, **HARP** Collaboration, “Measurement of the production of charged pions by protons on a tantalum target,” *Eur. Phys. J.* **C51** (2007) 787–824, [arXiv:0706.1600 \[hep-ex\]](#).
- [17] M. G. Catanesi *et al.*, “Particle identification algorithms for the HARP forward spectrometer,” *Nucl. Instrum. Meth.* **A572** (2007) 899–921.
- [18] M. G. Catanesi *et al.*, **HARP** Collaboration, “The HARP detector at the CERN PS,” *Nucl. Instrum. Meth.* **A571** (2007) 527–561.
- [19] M. G. Catanesi *et al.*, “Measurement of the production cross-section of positive pions in the collision of 8.9 GeV/c protons on beryllium,” *Eur. Phys. J.* **C52** (2007) 29–53, [arXiv:hep-ex/0702024](#).
- [20] M. H. Ahn *et al.*, **K2K** Collaboration, “Measurement of Neutrino Oscillation by the K2K Experiment,” *Phys. Rev.* **D74** (2006) 072003, [arXiv:hep-ex/0606032](#).
- [21] R. Gran *et al.*, **K2K** Collaboration, “Measurement of the quasi-elastic axial vector mass in neutrino oxygen interactions,” *Phys. Rev.* **D74** (2006) 052002, [arXiv:hep-ex/0603034](#).
- [22] S. Yamamoto *et al.*, **K2K** Collaboration, “An improved search for $\nu/\mu \rightarrow \nu/e$ oscillation in a long-baseline accelerator experiment,” *Phys. Rev. Lett.* **96** (2006) 181801, [arXiv:hep-ex/0603004](#).
- [23] M. G. Catanesi *et al.*, **HARP** Collaboration, “Measurement of the production cross-section of positive pions in p Al collisions at 12.9-GeV/c,” *Nucl. Phys.* **B732** (2006) 1–45, [arXiv:hep-ex/0510039](#).
- [24] M. Hasegawa *et al.*, **K2K** Collaboration, “Search for coherent charged pion production in neutrino carbon interactions,” *Phys. Rev. Lett.* **95** (2005) 252301, [arXiv:hep-ex/0506008](#).
- [25] E. Aliu *et al.*, **K2K** Collaboration, “Evidence for muon neutrino oscillation in an accelerator-based experiment,” *Phys. Rev. Lett.* **94** (2005) 081802, [arXiv:hep-ex/0411038](#).